

Title (en)  
OPTICAL SUBSTRATE, SEMICONDUCTOR LIGHT-EMITTING ELEMENT AND METHOD OF MANUFACTURING SEMICONDUCTOR LIGHT-EMITTING ELEMENT

Title (de)  
OPTISCHES SUBSTRAT, LICHEMITTIERENDES HALBLEITERELEMENT UND VERFAHREN ZUR HERSTELLUNG DES LICHEMITTIERENDEN HALBLEITERELEMENTS

Title (fr)  
SUBSTRAT OPTIQUE, ÉLÉMENT ÉLECTROLUMINESCENT SEMI-CONDUCTEUR ET PROCÉDÉ DE FABRICATION D'ÉLÉMENT ÉLECTROLUMINESCENT SEMI-CONDUCTEUR

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Application  
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• JP 2012103490 A 20120427  
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• JP 2012280241 A 20121221  
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Abstract (en)  
An optical substrate that includes a substrate and a concave-convex structure which is formed in a part or a whole of a surface of the substrate, wherein at least one part of the concave-convex structure includes a plurality of convex portions arranged apart from each other; at least one of the plurality of convex portions is a unique convex portion that includes one or more convex members or concave members in a surface and an average interval Pave in the concave-convex structure is equal to or more than 1.5  $\mu\text{m}$  but equal to or less than 10  $\mu\text{m}$ . When the optical substrate is used in a semiconductor light-emitting element, dislocations in a semiconductor layer are dispersed to reduce the dislocation density, and thus internal quantum efficiency IQE is improved, and a waveguide mode is removed by light scattering and thus the light the extraction efficiency LEE is increased, with the result that the efficiency of light emission of the semiconductor light-emitting element is enhanced.

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